A NEW SALVINIA FROM THE EOCENE

Edward W. Berry

The nominal fossil species of Salvinia number about a dozen, but they are always sufficiently rare to be of unusual interest. Several that have been described are poorly characterized or of doubtful botanical affinity so that the form which is the subject of the present note is well worthy of being called to the attention of botanists.

The most ancient known, as well as one of the best characterized, forms of Salvinia is *Salvinia Zeilleri* described very thoroughly by Fritel[1] and coming from the Sparnacian stage (lower Eocene) of the Paris basin. Next in point of age is the new species which is the subject of the present note.

This is represented by considerable material from the so-called Bridger formation of the Wind River basin in Wyoming collected by N. H. Brown; and by less extensive but more complete material from two localities in the Wilcox Eocene of western Tennessee collected by R. E. L. Collins. It may be incompletely characterized as follows:

Salvinia preauriculata Berry, n. sp. Figs. 1–4

Dorsal or floating leaves relatively thick, elliptical in outline, with a rounded apex and a rounded or slightly cordate base; varying in size, the maximum dimensions observed being 16 millimeters in length and 10 millimeters in width. The midvein is well defined. The laterals are thin, nearly straight, diverging at regular intervals, very ascending in the tip of the leaf, the angle of divergence increasing regularly proximad, the basal laterals being sometimes even slightly descending; they are connected by numerous thin and for the most part poorly seen oblique veinlets. The tubercles or pits lie in rows between the laterals and are usually well marked but somewhat irregularly developed. No ventral (submerged) leaves or sporocarps have been observed in the Wyoming material although spherical bodies about 2 millimeters in diameter are in close association with the leaves and these might possibly represent sporocarps. The specimen shown in fig. 4 from the Wilcox at Mandy, Tennessee,

[1] Fritel, P. H., Jour. Bot. (2) 1: 190. 1908.

is unique in showing a complete, and what appears to be a fruiting plant. Four floating leaves, three of which are nearly perfect are clearly made out, as well as 14 thread-like divisions of the submerged leaves with their appendages. Several of these dissected submerged leaves appear to be complete and are 2.5 centimeters in length. Immediately beneath the lowermost and incomplete floating leaf are two small sub-spherical bodies about 1.25 millimeters in diameter, and these appear to be in organic union with the submerged leaves at their base and to represent sporocarps. These are brownish carbonaceous and of considerable consistency so that when the plant was buried and flattened in the mud the floating leaf was pressed over them, and when the clay was split the leaf film over them flaked off. Immediately beside these objects, which are interpreted as sporocarps, is a similar impression in the clay without any carbonaceous residue which might represent a third sporocarp.

There can not be the slighest doubt regarding the botanical affinity of this species, and although it is not possible to verify the interpretation of the sporocarps, they appear very convincing. In the Wind River basin this species is found on the same slabs with the fruits of Sparganium and other representatives of a lake side or slack stream vegetation. In Tennessee it is associated with a large and varied costal and lagoon border flora.

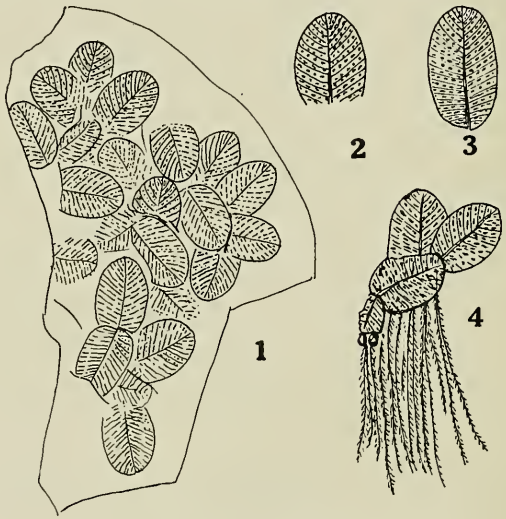
Occurrence: Bridger (?) Tipperary, Fremont County, Wyoming; Clover Creek, Hardeman County and Mandy, Madison County, Tennessee.

Salvinia preauriculata is so named because of its great similarity to the existing *Salvinia auriculata* Aublet, which ranges from Cuba and Central America to Paraguay. Among the described fossil species it is closest to *Salvinia Zeilleri* Fritel. The Wilcox beds in which it is found are correlated with Ypresian stage of the Eocene. The Wyoming occurrence, less certainly correlated, is somewhat younger and may belong in the Lutetian stage of the middle Eocene. If this is correct it would tend to indicate that this species had spread northward to Wyoming from Equatorial America during Eocene time.

The still existing species of Salvinia also number a dozen or more and they occur chiefly in the equatorial regions of both hemispheres, and are especially abundant in South America.

One species *Salvinia natans* Hoffm., ranges from southern France to India and northern China, and has been reported from several localities in the United States.

Continuing the enumeration of the fossil species it may be noted that there is a rather well marked species in the Puget group (upper Eocene or Oligocene) of Washington state; Miocene species in Colombia, South America; and in Virginia in this country. All of the remaining records are Old World, and include Oligocene species in France, Saxony, and Bohemia; and



SALVINIA PREAURICULATA Berry, n. sp.

FIGS. 1–3. Dorsal leaves from Tipperary, Wyoming.
FIG. 4. Nearly complete plant from Mandy, Tennessee.

Miocene occurrences in Germany, Bohemia, Switzerland, Transylvania, Tonkin, China, and Japan. These have been reviewed recently in an important paper by Florin.* Some of these species are said to show the dissected ventral leaves and sporocarps, and Brabenec, in a paper which I have not seen,† has described both micro- and mega-spores in *Salvinia formosa* Heer from the Miocene of the Saaz basin in Bohemia, but it is impossible to pass a critical judgment on a statement of this sort without seeing the specimens upon which it was based.

BALTIMORE, MD.

* Florin, R., Geol. Inst. Upsala Bull. **16**: 243–260. 1919.
† Brabenec, F., Rozpr. Ceske Akad. (2) 13. 1914.